## REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. The Applicants believe that all of these claims are now in allowable form.

In addition, the Applicants' representative would like to thank Examiner Choudhury for kindly taking a substantial amount of time on May 11, 2005 to discuss the merits of the subject invention. The Applicants' representative is aware of the time constraint that is placed on the Examiner and is appreciative of the Examiner's willingness to devote such large quantity of time to discuss the case on the merits.

### I. REJECTIONS OF CLAIMS 1-14 UNDER 35 U.S.C. § 102

The Examiner rejected claims 1-14 under 35 U.S.C. §102 as being anticipated by Gupta, Sandeep K.S. and Srimani, Pradip K. ("An Adaptive Protocol for Reliable Multicast in Mobile Multi-hop Radio Networks," (IEEE, 1999)) herein referred to as "Gupta"). In response, the Applicants have amended independent claims 1 and 14, from which claims 2-13 depend, to more clearly recite aspects of the present invention.

Gupta teaches a method for reconstructing a multicast tree that has become disconnected (*e.g.*, due movement of nodes in the network). Specifically, in order to reconstruct the disconnected tree, a node both sends a multicasting message to nodes to which it is still connected via the tree and also floods a "forwarding region" comprising nodes that are not part of the tree with the message. At this point, only nodes in the forwarding region continue to forward the message. In this manner, the forwarding region of the network becomes flooded with the message, such that the message eventually reaches disconnected nodes that were previously part of the multicast tree.

The Examiner's attention is directed to the fact that Gupta fails to disclose or suggest a method and network whereby a single node both receives and forwards an update message in accordance with a path tree, as positively claimed by the Applicants. Applicants' independent claims 1 and 14 positively recite:

1. In a multi-hop network including a plurality of nodes, a method for disseminating topology and link-state information over the multi-hop network, comprising:

maintaining a path tree for each source node in the network that can produce an update message, each path tree having that source node as a root node, a parent node, and zero or more children nodes;

receiving an update message from the parent node in accordance with the path tree maintained for the source node that originated the received update message, the update message including information related to a link in the network; and

forwarding the update message to children nodes, if any, in accordance with the path tree maintained for the source node that originated the update message in response to the information in the received update message, if it is determined that the update message should be forwarded to the zero or more children nodes. (Emphasis added)

14. A network, comprising:

a plurality of nodes in communication with each other over communication links, each node maintaining a path tree for each source node in the network that can produce an update message, each path tree having that source node as a root node, a parent node, and zero or more children nodes,

wherein one of the nodes (i) receives an update message from the parent node in accordance with the path tree maintained for the source node that originated the received update message, the update message including information related to a link in the network, (ii) and forwards the update message to children nodes, if any, in accordance with the path tree maintained for the source node that originated the update message in response to the information in the received update message, if it is determined that the update message should be forwarded to the children nodes. (Emphasis added)

In one embodiment, Applicants' invention teaches a method and network that uses the concept of reverse-path forwarding to broadcast each link-state in the reverse direction along a tree, e.g., using a tree formed by minimum-hop paths as an example. That is, each link-state update is broadcast along the path rooted at the source node of the update. The minimum-hop-path trees (one tree per source) are updated dynamically using the topology and link-state information that are received along the minimum-hop-path trees themselves. Based on the information received along the minimum-hop-path trees, each node computes a parent node and children nodes, if any, for the minimum-hop-path tree rooted at each source node. Each routing node may receive and forward updates originating from a source node along the minimum-

hop-path tree rooted at that source node. In this fashion, topology and link state information are disseminated without flooding the entire ad hoc network. (See Applicants' specification, page 16, line 3- page 23, line 3).

By contrast, none of the nodes in the network taught by Gupta can both receive and forward update messages in accordance with the established multicast tree. Specifically, the portions of Gupta that are cited by the Examiner teach a method in which an "update" message (*e.g.*, a multicast message attempting to reconstruct the multicast tree) generated by a disconnected node is sent only to linked non-tree nodes (*See*, Gupta, page 3, column 2, third paragraph: "... a forwarding region of a multicast tree node ... consists of only non-tree nodes." (Emphasis added)). Any node that subsequently receives the update message forwards the update message "only if it [the receiving node] is not a multicast tree node" (Emphasis added, *See*, Gupta, page 3, column 2, third paragraph). Thus, a node that is a part of the original multicast tree may receive the update message, but because it is part of the multicast tree it will not also forward the update message (*e.g.*, to children nodes). This is precisely the opposite practice of forwarding in accordance with a multicast tree – it is forwarding outside of the multicast tree only.

Conversely, while a node in the multicast tree taught by Gupta may be able receive update messages, it does not receive update messages in accordance with the multicast tree. That is, because only non-tree nodes can forward the update messages, a node that is a member of the multicast tree cannot receive a message from another node (*e.g.*, a parent node) that is also a member of the same multicast tree. Thus, the Applicants respectfully submit that claims 1 and 14, as amended, fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Dependent claims 2-13 depend, either directly or indirectly, from claim 1 and recite additional features thereof. As such and for at least the same reasons set forth above, the Applicants submit that claims 2-13 are also not anticipated by the teachings of Gupta. Therefore, the Applicants submit that claims 2-13 also fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

## II. VOLUNTARY AMENDMENTS

The Applicants have voluntarily amended claim 13 in order to replace the semicolon with which the claim previously ended with a period. The Applicants submit that this amendment corrects a minor typographical error only and does not in any way alter the scope of claim 13.

## III. CONCLUSION

Thus, the Applicants submit that none of the presented claims is anticipated under the provisions of 35 U.S.C. § 102. Consequently, the Applicants believe that all of the presented claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

6/3/05

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